
Taxonomic Notes on the *Genista ephedroides* Group (Fabaceae) from the Mediterranean Area

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ABSTRACT. A revision of the taxa belonging to the *Genista ephedroides* group (Fabaceae, Cytiseae) occurring in the Tyrrhenian area is presented. The study, carried out on the basis of the literature, herbarium material, and field and karyological investigations, allows the recognition of 13 taxa. Eight are already known: *G. cilentina* Vals., *G. demarcoi* Brullo, Scelsi & Siracusa, *G. dorycnifolia* Font Quer, *G. ephedroides* DC., *G. gasparrinii* (Guss.) C. Presl, *G. numidica* Spach, *G. tyrrhena* Vals., and *G. valsecchiai* Brullo & De Marco, and five are new to science. *Genista bocchierii* Bacch., Brullo & Feoli Chiapella, *G. insularis* Bacch., Brullo & Feoli Chiapella, *G. insularis* subsp. *fodinae* Bacch., Brullo & Feoli Chiapella, and *G. ovina* Bacch., Brullo & Feoli Chiapella are described from Sardinia, Italy, while *G. tyrrhena* subsp. *pontiana* Brullo & De Marco is described from the Pontine Archipelago of Latium, Italy. Karyologically, most of the taxa are characterized by the somatic number $2n = 48$ (*G. bocchierii*, *G. cilentina*, *G. demarcoi*, *G. dorycnifolia*, *G. gasparrinii*, *G. tyrrhena* subsp. *tyrrhena*, *G. ephedroides*, *G. valsecchiai*, *G. insularis*), with accessory chromosomes occasionally yielding higher counts. In addition to $2n = 48$, the new report of $2n = 44$ is noted for the new species *G. ovina*. A new count of $2n = 48$ is reported for *G. tyrrhena* subsp. *tyrrhena*, whereas higher counts ($2n = 48 + 0-2B$, 72, 96) are reported for the new subspecies *G. tyrrhena* subsp. *pontiana*. For each examined taxon, notes are given on the nomenclature, karyology, ecology, and chorology, while a detailed iconography is lacking only for *G. numidica* and *G. dorycnifolia*. An analytical key for the *G. ephedroides* group is presented. Lectotypes are designated for *G. numidica* and *Spartium gymnopterum* Viv.

Key words: Fabaceae, *Genista*, *Genista ephedroides* group, IUCN Red List, Mediterranean.

A contribution to the taxonomical investigations on the genus *Genista* L. (Fabaceae, Cytiseae) focused on the taxa belonging to the *G. ephedroides* group is presented. According to Valsecchi (1986a, 1986b, 1993a, 1993b), De Marco et al. (1987), Brullo et al. (1993), Brullo and De Marco (1996), Estabrook (2001), De Castro et al. (2002), and Pardo et al. (2004), the species so far known within this group are: *G. cilentina* Vals., *G. demarcoi* Brullo, Scelsi & Siracusa, *G. dorycnifolia* Font Quer, *G. ephedroides* DC., *G. gasparrinii* (Guss.) C. Presl, *G. numidica* Spach, *G. tyrrhena* Vals., and *G. valsecchiai* Brullo & De Marco. On the basis of the literature, as well as herbarium and field investigations, these taxa are morphologically well distinguished from the other Mediterranean species of *Genista*. According to Spach (1844) and Valsecchi (1993b), the *G. ephedroides* group must be referred to *Genista* sect. *Ephedrospartum* Spach, which includes unarmed and ephedriform shrubs with 1- to 3-foliolate leaves, long racemose and many-flowered inflorescences, and entire and caducous bracts and bracteoles.

The morphological study was carried out mostly on living material collected during field investigations, as well as on herbarium specimens from various herbaria (BC, BM, C, CAG, CAT, FI, G, LG, M, NAP, OXF, P, PAL, RO, TO, TSB, W, WU).

These investigations revealed other taxa that are morphologically distinct from any known species of the group. Like the previously recognized taxa within the *Genista ephedroides* group, the new taxa are distributed in the central Mediterranean area, predominantly in the Tyrrhenian area. In particular, *G. ephedroides*, *G. valsecchiai*, and three new species are circumscribed to Sardinia; *G. gasparrinii* and *G. demarcoi* occur in Sicily; both the autonymic subspecies of *G. tyrrhena* and one new subspecies occur in the Aeolian and Pontine Islands, respec-

tively; *G. cilentina* occurs in southern Italy; *G. dorycnifolia* is found in Ibiza (Balearic Islands); and *G. numidica* occurs in northeastern Algeria.

From a phytogeographic point of view, the Tyrrhenian area represents a very important area of the Mediterranean basin, because it is a speciation center for many plant groups associated with Tertiary floras (Braun-Blanquet, 1926; Favarger & Contandriopoulos, 1961; Cardona & Contandriopoulos, 1979; Arigoni, 1983). According to the distribution of the taxa of the *Genista ephedroides* group, three main centers of speciation were identified: the southeastern Tyrrhenian coast (Sicily and southern Italy), the southwestern Tyrrhenian islands (Ibiza and Sardinia), and Maghreb (Algeria). In particular, a significant concentration of taxa has been observed in southwestern Sardinia (Sulcis-Iglesiente sector), where *G. valsecchiae*, *G. bocchieri* Bacch., Brullo & Feoli Chiapella, *G. insularis* Bacch., Brullo & Feoli Chiapella subsp. *insularis*, and *G. ovina* Bacch., Brullo & Feoli Chiapella occur. This area is unique from a floristic point of view mainly for its paleogeographic history (Bacchetta, 2006; Bacchetta et al., 2007). Many endemics grow in this sector, as other species of *Genista*: *G. arbustensis* Vals., *G. sulcitana* Vals., and *G. morisii* Colla (Valsecchi, 1976, 1984, 1986a), all localized on siliceous substrates (granite, metamorphic, and volcanic rock).

In southwestern Sardinia, diverse other species of *Genista* are present, as *G. sardoa* Vals., endemic to the western coastal zone; *G. aetnensis* (Biv.) DC., endemic to Sardinia and Mount Etna in Sicily; *G. corsica* (Loisel.) DC., endemic to Sardinia and Corsica; and *G. ferox* Poir., distributed in Algeria, Tunisia, and the western zone of Sardinia (Arrigoni & Vannelli, 1967; Valsecchi, 1977, 1981, 1984). In the southeastern Tyrrhenian area, the species of *Genista* (*G. cilentina*, *G. gasparrini*, *G. demarcoi*, *G. tyrrhena* subsp. *tyrrhena*, and its new subspecies) show a very scattered distribution and are localized on different substrates (limestone, metamorphic, and volcanic rock). Other endemic species of *Genista* grow on the siliceous substrates of the Tyrrhenian slope of Sicily, as *G. aristata* C. Presl, *G. cupani* Guss., and *G. madoniensis* Raimondo (Gibbs, 1966; Raimondo, 1999). The third center for the *G. ephedroides* group can be found in Algeria, where *G. numidica* grows, which can be considered a separate and distinct species complex. In fact, additional taxa closely related to this species have been described by Pomet (1874) at the species level (*G. ischnocnada* Pomet, *G. satrotes* Pomet, *G. filiramea* Pomet), and these names were successively considered by Battandier (1919) and Maire (1987) as subspecies of *G. numidica*.

Unfortunately, it is impossible to clarify the taxonomic relationships of these taxa, because the present sociopolitical situation of Algeria does not permit field investigations for the collection of living material necessary to check the morphological characters and the variability of the populations. Other endemic species of *Genista* grow in Algeria, sometimes reaching the neighboring zone of Tunisia, as *G. repres* Pomet, *G. microcephala* Coss. & Durieu, *G. spinulosa* Pomet, and *G. ulicina* Spach (Quzel & Santa, 1962; Maire, 1987). Most likely, the *G. ephedroides* group derives from a common ancestor that had a wide distribution throughout the southern Tyrrhenian area. As a consequence of the geographical isolation and the different ecologies here, speciation triggered the differentiation of numerous taxa.

The karyological investigation was carried out on seeds collected in the field. Voucher specimens of seeds are deposited in CAG, CAT, and TSB. Mitotic phases were observed from root tips of seedlings, pretreated with 8-hydroxyquinoline, fixed in a 1:3 solution of glacial acetic acid:absolute ethanol (Carnoy's fluid), hydrolyzed in 1N HCl at 60°C for 6 min., and stained using the routine Feulgen method, with slides prepared by the squash technique.

The *Genista ephedroides* group is quite homogeneous from a karyological point of view: the same somatic chromosome number $2n = 48$ was counted in nine taxa (*G. bocchieri*, *G. cilentina*, *G. demarcoi*, *G. dorycnifolia*, *G. gasparrini*, *G. tyrrhena* subsp. *tyrrhena*, *G. ephedroides*, *G. valsecchiae*, and *G. insularis*), sometimes with two or four accessory chromosomes. Different counts were made only for *G. ovina* ($2n = 44$), while for *G. tyrrhena* subsp. *pontiana* Brullo & De Marco, in addition to $2n = 48$, counts of $2n = 72$ or $2n = 96$ were also made. The number $2n = 48$ traces back to the basic number $x = 12$, which is by far the most common secondary basic number in *Genista* and in other genera of the Cytiseae (Sañudo, 1979; Cusma Velari & Feoli Chiapella, 1994; Cusma Velari et al., 2003). All the taxa of the *G. ephedroides* group are therefore tetraploid.

I. Genista L., Sp. Pl. 2: 709–711. 1753. TYPE:
Genista tinctoria L.

Species in the *Genista ephedroides* group include: *G. cilentina*, *G. demarcoi*, *G. dorycnifolia*, *G. ephedroides*, *G. gasparrini*, *G. numidica*, *G. tyrrhena*, and *G. valsecchiae*. Five new taxa are proposed in this paper, including two new subspecies and three new species. Based on their ephedriform habit, 1- to 3-foliate leaves, long and many-flowered inflorescences, and entire and caducous bracts and bracte-

oles, all the new taxa described here clearly belong to *Genista* sect. *Ephedrospartum*.

The new species described from southern Sardinia are closely related to *Genista valsecchiae* and *G. ephedroides*. In particular, *G. ovina* seems to be morphologically more strongly differentiated from these taxa because it is characterized by a compact and pulvinate habit; well-developed bracts; ovate-triangular bracteoles; a corolla with longer wings and shorter keel; longer, elliptical-lanceolate, rounded, and not apiculate anthers; and sometimes an aneuploid chromosome complement ($2n = 44$). *Genista insularis* is well differentiated from the other Sardinian species belonging to this group by its longer bracts, retuse standard, and shortly nerved calyx. Within this species, we recognize two morphologically and ecologically well-differentiated taxa, which are here treated at subspecific level. They are *G. insularis* subsp. *insularis* and *G. insularis* subsp. *fodinae* Bacch., Brullo & Feoli Chiapella. The latter can be distinguished from the type in having larger bracts and flowers, linear-subulate bracteoles,

and smaller anthers, as well as by its exclusive localization on metalliferous substrates. Finally, *G. bocchieri* is very peculiar because it is characterized by a habit that typically tends to the arborescent form, bracts and bracteoles that are very narrow and long apiculate, and calyx teeth that are narrowly triangular-subulate and long apiculate. This species is also differentiated ecologically by growing very near the sea on loose substrates. Within *G. tyrrhena*, we recognize the new subspecies *pontiana*, which is differentiated from the type in having longer bracts, shorter and narrower bracteoles, a calyx with thin veins and shorter teeth, and buds with wings exserted from the standard. On the other hand, both subspecies share some characters, such as the long and many-flowered inflorescences, the calyx with straight lower lip teeth, the rounded and apiculate standard, the apiculate anthers 1.2–1.4 mm long, and the legume longer than 8 mm. Furthermore, both subspecies grow on volcanic substrates but have allopatric distribution ranges.

KEY TO THE SPECIES OF THE *GENISTA EPHEDROIDES* GROUP

- 1a. Calyx 2–3 mm long with lips subequal, 1–1.8 mm long; calyx teeth triangular, obtuse.
 - 2a. Leaves 3–7 mm long; bracts 2.5–2.7 mm long; bracteoles subulate; standard retuse at the apex, 5–7 mm long; wings 6–7 mm long with glabrous lateral lobe *G. gasparrinii*
 - 2b. Leaves 8–18 mm long; bracts 1–1.2 mm long; bracteoles ovate; standard rounded at the apex, 8–8.5 mm long; wings 8–9.5 mm long with a tuft of hairs on the lateral lobe *G. dorycnifolia*
- 1b. Calyx 3–7 mm long with lips unequal, 1.8–4.2 mm long; calyx teeth linear to ovate-triangular, acute to acuminate.
 - 3a. Lower lip of the calyx with central tooth shorter than the lateral ones; standard with short apiculum at the apex; legume 8–11 mm long.
 - 4a. Bracteoles lanceolate to ovate, 2–4.5 mm long; lower lip of the calyx 2.5–4 mm long, with teeth 0.8–2 mm long *G. tyrrhena* subsp. *tyrrhena*
 - 4b. Bracteoles lanceolate-subulate to subulate, 1.8–2 mm long; lower lip of the calyx 2–2.7 mm long, with teeth 0.7–1 mm long *G. tyrrhena* subsp. *pontiana*
 - 3b. Lower lip of the calyx with central tooth longer than the lateral ones or subequal; standard without apiculum at the apex; legume 5–8 mm long.
 - 5a. Bracteoles 2–3 mm long; calyx 5.5–6.5 mm long; wings with a notably ciliate, lateral furrow *G. cilentina*
 - 5b. Bracteoles 0.5–1.5(–2) mm long; calyx 3–5 mm long; wings without a ciliate lateral furrow.
 - 6a. Lower lip of the calyx with central tooth much longer than the lateral ones; anthers 0.5–0.75 mm long, aristate; legume 5.5–6 mm long *G. numidica*
 - 6b. Lower lip of the calyx with teeth subequal or with the central one slightly longer than the lateral ones; anthers 0.8–1.3 mm long, apiculate or rounded; legume 7–8 mm long.
 - 7a. Standard retuse at the apex.
 - 8a. Pulvinate shrub, 30–80 cm tall; bracts 1.5–2.5 mm long; bracteoles subulate, 1.5–2 mm long; calyx with lower lip teeth 0.8–1.5 mm long *G. demarcoi*
 - 8b. Erect shrub, 100–200 cm tall; bracts 3.5–6.5 mm long; bracteoles lanceolate or triangular-lanceolate, 1.2–1.5 mm long; calyx with lower lip teeth 0.4–0.8 mm long.
 - 9a. Bracts linear, 3.5–4 mm long; calyx 3.5–4 mm long; standard 6.5–7 mm long; wings 6.5–7 mm long; keel 8–8.5 mm long; anthers 1.2–1.3 mm long *G. insularis* subsp. *insularis*
 - 9b. Bracts oblong-linear, 5–6.5 mm long; calyx 4–4.5 mm long; standard 8–9 mm long; wings 7.5–8.5 mm long; keel 9–10 mm long; anthers ca. 1 mm long *G. insularis* subsp. *fodinae*
 - 7b. Standard rounded or obtuse at the apex.
 - 10a. Branches contracted; standard 6–6.5 mm long, obtuse at the apex *G. valsecchiae*
 - 10b. Branches loose; standard 7–8 mm long, rounded at the apex.

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- 11a. Bracts triangular-lanceolate, 1–3 mm long; wings 5.5–6.2 mm long *G. ephedroides*
 11b. Bracts oblong-linear to linear-subulate, 2.5–4.5 mm long; wings 7–8 mm long *G. ovina*
 12a. Pulvinate shrub, 30–60 cm tall; bracteoles ovate-triangular; calyx with lower lip 3–3.5 mm long; anthers elliptical, rounded at apex *G. ovina*
 12b. Erect shrub, 100–300 cm tall; bracteoles linear-subulate; calyx with lower lip 1.8–2 mm long; anthers ovate-lanceolate, apiculate *G. bocchieri*

1. Genista bocchieri Bacch., Brullo & Feoli Chiapella, sp. nov. TYPE: [Italy. Sardinia:] Santa Margherita di Pula, Pula (CA), depositi alluvionali quaternari, 9 June 1998, *G. Bacchettia* & *S. Brullo* s.n. (holotype, CAT; isotypes, CAG, CAT, FI). Figures 1A₄, B₄, 3A₆, B₆.

Haec species a *Genista valsecchiae* Brullo & De Marco habitu arborescenti usque ad 300 cm alto, ramis flexuosis acutis inermibus, bracteolis linearisubulatis, calycis labio inferiore 1.8–2 mm longo, dentibus erectis 1–1.2 mm longis, vexillo ad apicem rotundato 7–8 mm longo 6–6.5 mm lato, alis ca. 7.5 mm longis, carna ca. 8.5 mm longa atque alis in alabastro e vexillo leviter exsertis differt.

Erect shrub to arborescent, robust, lax, 100–300 cm tall, with branches flexuous, alternate or subclustered, acute at the apex, striate, pubescent. Leaves 3-foliate, uppermost often simple, sessile, linear-lanceolate, revolute, sericeous, 2–10 mm, caducous. Inflorescence ± dense, 2.5–5 cm, 5- to 12-flowered; bracts linear-subulate, long apiculate, 2.5–4 mm, slightly longer than the pedicel; bracteoles linear-subulate, long apiculate, 1.2–1.5 mm, inserted at calyx base. Calyx sericeous, conic-campanulate, 3.5–4 mm, with veins incrasate and decurrent only in the lip, lower lip longer than the upper, 1.8–2 × 1.5–1.8 mm, with teeth subequal, triangular-subulate, erect, 1–1.2 mm, upper lip with teeth 1-nerved, triangular-subulate, apiculate, 1.5–1.8 mm; floral buds with wings exserted from the standard; corolla yellow; standard ovate-cordate, rounded at the apex, 7–8 × 6–6.5 mm, sericeous on the back; wings ca. 7.5 mm, with a tuft of hairs on basal gibbosity; keel ca. 8.5 mm, sericeous on outer faces; anthers ovate-lanceolate, apiculate, 1–1.1 mm. Legume totally pubescent, ovate-beaked, 8 mm.

Chromosome number. $2n = 48$ (Pula, San Margherita di Pula, Km 38.750 [Cagliari], 16 Mar. 1997, *G. Bacchetta* s.n. [TSB], new count).

Distribution and ecology. *Genista bocchieri* is known only from San Margherita di Pula, near Cagliari in southwestern Sardinia, where it grows on granitic sands and alluvial substrates at altitudes from 0 to 30 m. It is a component of acidophilous maquis vegetation and represents the dominant

shrub. The bioclimate is Mediterranean pluviseasional-oceanic, with thermotype upper thermomediterranean and ombrotype upper dry (Bacchetta, 2006). **IUCN Red List category.** *Genista bocchieri* is assessed here as Endangered (EN) according to IUCN Red List criteria (IUCN, 2001, 2003).

Etymology. The species is named in honor of Emanuele Bocchieri (1941–), botanist at Cagliari University.

Paratypes. ITALY. Sardinia: Santa Margherita, 6 June 1971, *N. Kaae* s.n. (C); Pula, S. Margherita di Pula, Km 38.750 (Cagliari), 16 Mar. 1997, *G. Bacchetta* s.n. (CAG, TSB); Calaverde, Pula (Cagliari), 18 Apr. 1998, *G. Bacchetta* s.n. (CAG, TSB); Calaverde (Sta. Margherita di Pula), Pula (CA), 18 Apr. 1998, *G. Bacchetta* s.n. (CAG).

2. Genista ciliatina Vals., Boll. Soc. Sarda Sci. Nat. 29: 255. 1992 [1993]. TYPE: [Italy. Campania:] Cilento, macchia e rocce alla Torre del Telegrafo, a sud di Ascea, 50–100 m, 26 Mar. 1968, *G. Moggi* s.n. (holotype, FI). Figures 2A₅, B₅, 3A₁₀, B₁₀.

Erect shrub, robust, intricate, 50–180 cm tall, with branches rigid, alternate or subclustered, acute at the apex, striate, pubescent. Leaves 3-foliate, uppermost often simple, sessile, linear-lanceolate, revolute, sericeous, 4–13 mm, caducous. Inflorescence ± dense, 3–12 cm, 10- to 35-flowered; bracts triangular-lanceolate to linear-sublanceolate, 3–13 mm, slightly longer than the pedicel; bracteoles linear-subulate, 2–3 mm, inserted at the calyx base. Calyx sericeous, conic-campanulate, 5.5–6.5 mm, with veins thin and decurrent only in the lip, lower lip longer than the upper, 3.5–4.2 × 2.3–3 mm, with teeth unequal, triangular, divaricate, lateral ones 0.5–0.6 mm, central one 1–1.2 mm, upper lip with teeth 1-nerved, ovate-triangular, apiculate, 2–2.2 mm; floral buds with wings shortly exserted from the standard; corolla yellow; standard cordate, retuse at the apex, 8–10 × 7–9 mm, sericeous on the back; wings 8–10 mm, with a tuft of hairs on the basal gibbosity and a lateral furrow notably ciliate; keel 9–

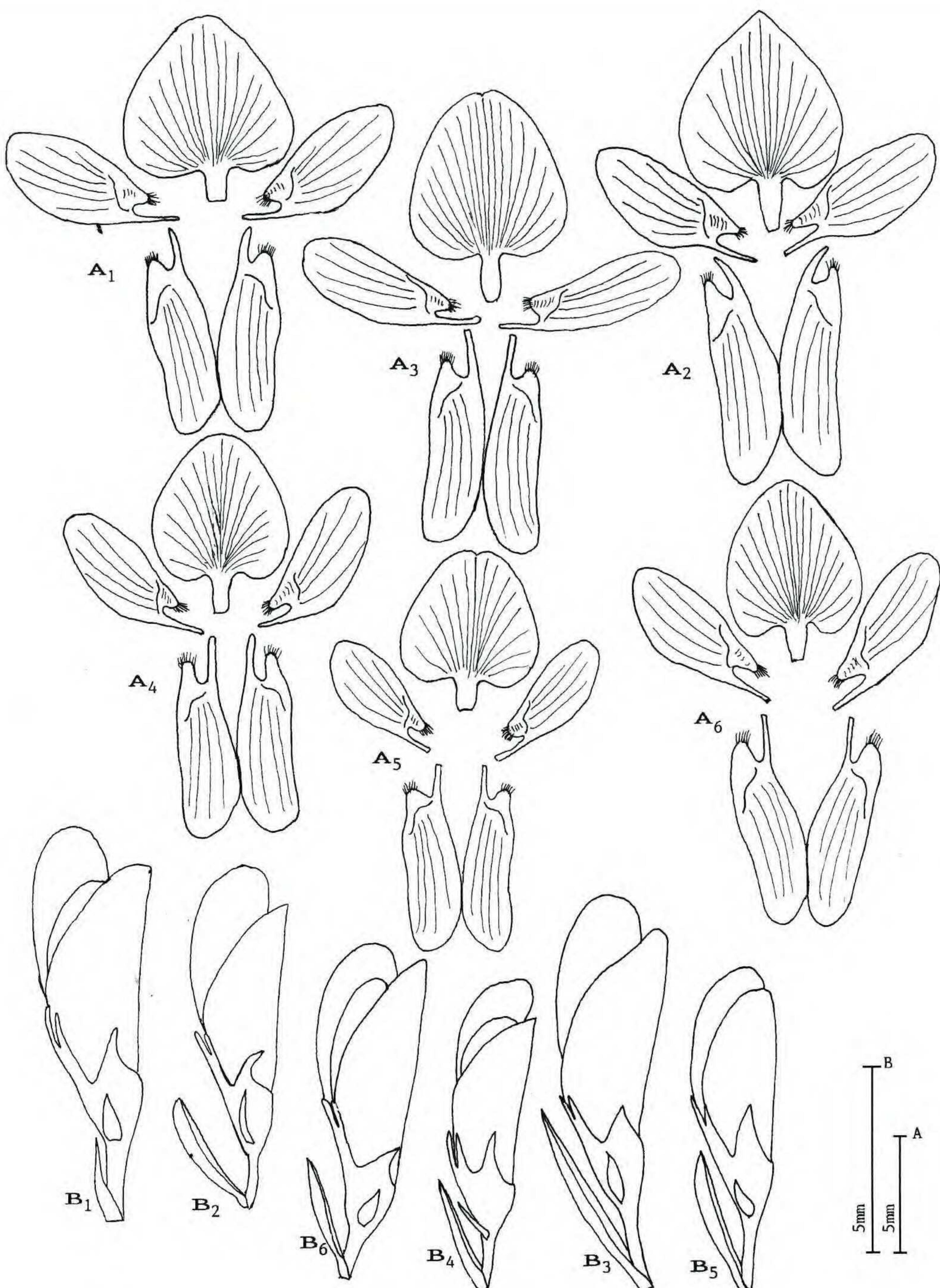


Figure 1. Corolla dissections or segments (A) and floral buds (B). —A₁, B₁. *Genista ephedroides* DC., based on 3 May 1995, Brullo & De Marco s.n. (CAT). —A₂, B₂. *G. valsecchiae* Brullo & De Marco, based on the type, 11 May 1994, Brullo et al s.n. (CAT). —A₃, B₃. *G. insularis* subsp. *fodinae* Bacch., Brullo & Feoli Chiapella, based on the type, 6 June 2002, Bacchetta et al. s.n. (CAT). —A₄, B₄. *G. bocchierii* Bacch., Brullo & Feoli Chiapella, based on the type, 9 June 1998, Bacchetta & Brullo s.n. (CAT). —A₅, B₅. *G. insularis* Bacch., Brullo & Feoli Chiapella subsp. *insularis*, based on the type, 7 June 2002, Bacchetta et al. s.n. (CAT). —A₆, B₆. *G. ovina* Bacch., Brullo & Feoli Chiapella, based on the type, 9 Mar. 2004, Bacchetta et al. s.n. (CAT).

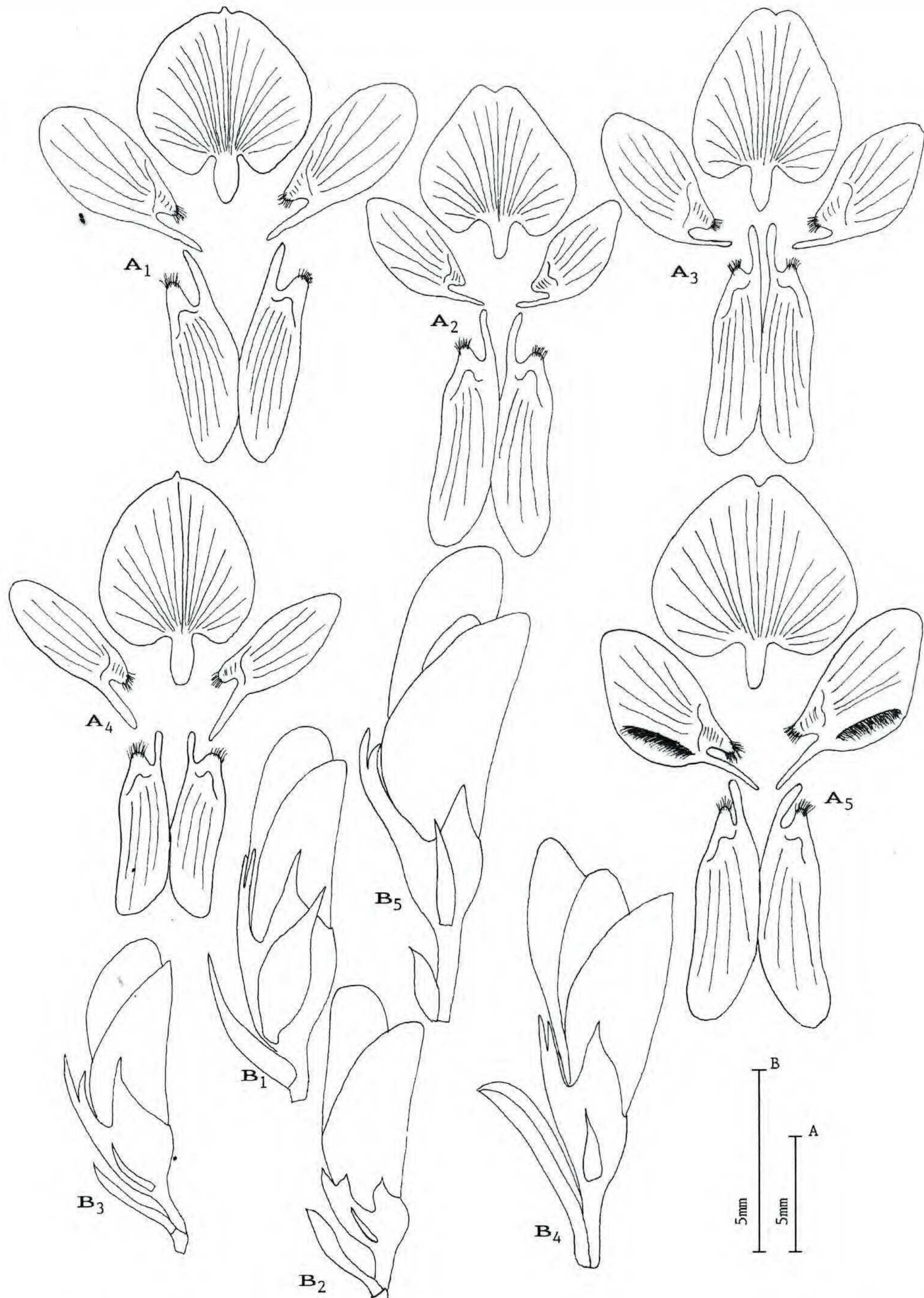


Figure 2. Corolla segments (A) and floral buds (B). —A₁, B₁. *Genista tyrrhenia* Vals. subsp. *tyrrhenia*, based on 17 June 1992, Minissale s.n. (CAT). —A₂, B₂. *G. gasparrini* (Guss.) C. Presl, based on 24 May 1992, Scelsi & Siracusa s.n. (CAT). —A₃, B₃. *G. demarcoi* Brullo, Scelsi & Siracusa, based on the type, 3 June 1992, Brullo & Scelsi s.n. (CAT). —A₄, B₄. *G. tyrrhenia* subsp. *pontiana* Brullo & De Marco, based on the type, 16 May 1993, Brullo et al. s.n. (CAT). —A₅, B₅. *G. cilentina* Vals., based on "Marina di Ascea presso Torre del Telegrafo (Pisciotta)," 16 May 1993, Brullo et al. s.n. (CAT).

10 mm, sericeous on the outer faces; anthers ovate, apically obtuse, 0.9–1.1 mm. Legume totally pubescent, ovate-beaked, 5–6 mm.

Iconography. Valsecchi (1993a, fig. 1).

Chromosome number. $2n = 48$ (Marina di Ascea; Pizzolongo, 1961).

Distribution and ecology. *Genista cilentina* is localized in a short stretch of the Cilento coast in southern Italy, where it grows on flysch substrates. It is a component of *Juniperus turbinata* Guss. maquis and acidophilous garigue vegetation at altitudes of 50–200 m. The bioclimate is Mediterranean pluviseasonal-oceanic, with thermotype ranging between upper thermomediterranean and lower mesomediterranean, and ombrotype between upper dry and lower subhumid (Rivas-Martínez, 2007).

IUCN Red List category. *Genista cilentina* has been previously evaluated as Critically Endangered (CR) according to IUCN Red List criteria (Scoppola & Spampinato, 2005).

Additional specimens examined. ITALY. Campania: Kampanien, prov. Salerno, ca. 5 km N von Palinuro unter Strasse nach Pisciotta, 6 June 1968, D. Podlech 5555 (M), 6 June 1968, Haesler 2266 (C); Pisciotta, Golfo di Policastro, 11 May 1983, G. De Marco s.n. (CAT), 16 May 1993, S. Brullo, F. Scelsi & G. Siracusa s.n. (CAT); Marina di Ascea presso Fiumicello (Pisciotta), 16 May 1993, S. Brullo, F. Scelsi & G. Siracusa s.n. (CAT); Marina di Ascea presso Torre del Telegrafo (Pisciotta), 16 May 1993, S. Brullo, F. Scelsi & G. Siracusa s.n. (CAT); Cilento (Salerno), 27 July 1997, D. Puntillo s.n. (TSB); Cilento, Marina di Ascea, sotto la torre del Telegrafo (Salerno), 24 Apr. 2000, M. Tretiach s.n. (TSB).

3. *Genista demarcoi* Brullo, Scelsi & Siracusa, Fl. Medit. 3: 304. 1993. TYPE: [Italy.] Sicilia, rupi di Isnello, 3 June 1992, S. Brullo & F. Scelsi s.n. (holotype, CAT; isotypes, CAT, FI, PAL). Figures 2A₃, B₃, 3A₈, B₈.

Pulvinate, intricate, 30–80 cm tall, with branches flexuous, slender, alternate or subclustered, obtuse at the apex, striate, sericeous. Leaves 3-foliate, uppermost often simple, sessile, linear-lanceolate, revolute, sericeous, 4–14 mm, caducous. Inflorescence ± dense, 1.5–7 cm, 3- to 11-flowered; bracts linear-subulate, 1.5–2.5 mm, much longer than the pedicel; bracteoles subulate, 1.5–2 mm, inserted at the calyx base. Calyx sericeous, conic-campanulate, 3.5–5 mm, with veins thin and extended almost up to the base, lower lip longer than the upper, 2.5–2.6 × 0.8–1 mm, with teeth unequal, lanceolate-subulate, divaricate, lateral ones 0.8–1 mm, central one 1–1.5 mm, upper lip with teeth 1-nerved, triangular,

apiculate, 1.5–2 mm; floral buds with wings wholly covered by the standard; corolla yellow; standard ovate-triangular, subretuse at the apex, 8–9 × 7–8 mm, sericeous on the back; wings 7–9 mm, with a tuft of hairs on the basal gibbosity; keel 10–12 mm, sericeous on the outer faces; anthers ovate, apiculate, ca. 1 mm. Legume sparsely pubescent, subcircular or broadly ovate, 7–8 mm.

Iconography. Brullo et al. (1993, figs. 1, 4A2, 4B2).

Chromosome number. $2n = 48$ (San Maria di Isnello [Palermo], 18 June 1997, E. Schimmenti s.n. [TSB], new count).

Distribution and ecology. *Genista demarcoi* is a punctiform endemic species, localized only in the Madonie massif near Isnello in northern Sicily. The species is linked to Mesozoic limestone, growing on cliffs and in rupestrian garigue scrubland at altitudes between 800 and 1000 m. The bioclimate is Mediterranean pluviseasonal-oceanic, with thermotype upper mesomediterranean and ombrotype lower subhumid (Brullo et al., 1996).

IUCN Red List category. *Genista demarcoi* has been previously evaluated as Critically Endangered (CR) according to IUCN Red List criteria (Scoppola & Spampinato, 2005).

Additional specimens examined. ITALY. Sicily: Isnello alle Madonie, s.d., G. Gasparrini s.n. (NAP-GUSS), G. Gussone s.n. (FI); Isnello, 8 July 1830, A. Todaro s.n. (PAL), 16 June 1870, M. Lojacono s.n. (FI), 1 June 1986, S. Brullo s.n. (CAT); Sicilia, 1841, G. Gussone s.n. (G); in Sicilia, 1845, A. Alexander s.n. (BM); in apricis Nebrodum prope Isnello, 19 June 1855, A. Huet du Pavillon s.n. (BM, G, M, OXF); Cefalù, June 1856, Mandralisca s.n. (PAL); Pizzo di Pilo, June 1859, Mandralisca s.n. (PAL), 9 July 1973, S. Brullo (CAT); Madoniarum prope Isnello, 18 June 1873, G. Strobl s.n. (G, M); Madonie, 3 June 1902, H. Ross s.n. (G); Madonie, Isnello, 5 June 1902, H. Ross 321 (FI, G, M, WU); Madonie, June 1903, H. Ross s.n. (BM, M); Tra Castelbuono e Roccarossa, Madonie, 14 May 1978, S. Pignatti s.n. (TSB); Palermo, ca. 22 km S of Cefalù, N side of Isnello, 26 May 1979, P. H. Davis & B. Sutton 63796 (BM); S. Maria di Isnello (Palermo), 18 June 1997, E. Schimmenti s.n. (TSB).

4. *Genista dorycnifolia* Font Quer, Butl. Inst. Catalana Hist. Nat. 20: 46. 1920. *Genista numidica* var. *dorycnifolia* (Font Quer) Knoche, Fl. Balear. 2: 62. 1922. *Genista numidica* subsp. *dorycnifolia* (Font Quer) Knoche ex Colom, Biogeogr. Balear., ed. 2, 1: 186. 1978. TYPE: [Spain. Balearic Islands:] Eivissa [Ibiza], Puig Sirer, 200 m, cara a W, 18 May 1919, P. Font Quer s.n. (lectotype, designated by Rosselló & Sáez [2001: 73], BC 13591).

Genista dorycnifolia var. *grosii* Font Quer, Butl. Inst. Catalana Hist. Nat. 20: 48. 1920. *Genista grosii* (Font Quer) Font Quer, Mem. Real Acad. Ci. Barcelona 20: 151. 1927. *Genista dorycnifolia* subsp. *grosii* (Font Quer) Font Quer & Rothm., Schedae Fl. Iber. Select., Cent. II-III: n. 239. 1935. TYPE: [Spain. Balearic Islands:] Eivissa [Ibiza], Sta. Agnès, Cala de les Torretes, 29 May 1918, *Gros s.n.* (lectotype, designated by Rosselló & Sáez [2001: 73], BC 13947).

Erect shrub to arborescent, robust, 70–300 cm tall, with branches lax, flexuous, alternate or subclustered, obtuse at the apex, striate, sericeous. Leaves 3-foliate, uppermost often simple, subsessile, linear to linear-oblong, revolute, sericeous, 8–18 mm, caducous. Inflorescence dense and capitate, 1–2 cm, 5- to 18-flowered; bracts linear-oblanceolate, 1–1.2 mm, longer than the pedicel; bracteoles ovate, 0.6–0.8 mm, inserted at the calyx base. Calyx pubescent, campanulate, 2–3 mm, with veins thin and extended almost up to the base, lower lip subequal to the upper, ca. 1 × 3 mm, with teeth subequal, triangular, obtuse, not divaricate, ca. 0.5 mm, upper lip with teeth 1-nerved, triangular-ovate, obtuse, ca. 1.8 mm; floral buds with wings wholly covered by the standard; corolla yellow; standard ovate, rounded or sometimes emarginate at the apex, 8–8.5 × 5–6 mm, sericeous on the back; wings 8–9.5 mm, with a tuft of hairs on the basal gibbosity; keel 10–13 mm, sericeous on the outer faces; anthers ovate, apiculate, 0.9–1.2 mm. Legume sericeous, ovoid-beaked, 8–9 mm.

Iconography. Talavera (1999, lám. 21).

Chromosome number. $2n = 48$ (Ibiza; Santos, 1944–1945; Cardona & Contandriopoulos, 1983).

Distribution and ecology. *Genista dorycnifolia* is endemic to Ibiza (Balearic Islands), where it grows in garigue scrubland and forests of *Pinus halepensis* Mill. at altitudes of 0–200 m. The bioclimate is Mediterranean pluviseasonal-oceanic, with thermotype lower thermomediterranean and ombrotype lower dry (Rivas-Martínez et al., 1992).

IUCN Red List category. *Genista dorycnifolia* is assessed here as Near Threatened (NT) according to IUCN Red List criteria (IUCN, 2001, 2003).

Additional specimens examined. SPAIN. Balearic Islands: Cala d'Hort (Ibiza), 1 Apr. 1990, M. Herrera Gallastegui [Société pour l'échange des Plantes vasculaires de l'Europe et du Bassin Méditerranéen] 15209 (TSB).

5. *Genista ephedroides* DC., Prodr. (DC.) 2: 147. 1825. *Genista ephedroides* DC., Mem. Legum.: 210. [1 Mar.] 1826, nom. illeg. TYPE: [Italy. Sardinia:] Longo Sarda Sardaigne, 1824, H. A.

Soleiro (lectotype, designated by Valsecchi [1986: 198], G-DC). Figures 1A₁, B₁, 3A₁, B₁.

Spartium gymnopterum Viv., App. Fl. Cors. 1825. TYPE: Corsica, s.d., s. coll. [sub *Spartium gymnopterum* Viv., manu Viviani, et manu de Candolle, "mi. Viviani 1826"] (lectotype, designated here, G-DC).

Erect shrub to arborescent, robust, intricate, 100–180 cm tall, with branches flexuous, alternate or subclustered, mucronate at the apex, striate, pubescent. Leaves 3-foliate, uppermost often simple, sessile, linear-lanceolate, revolute, sericeous, 3–10 mm, caducous. Inflorescence ± dense, 4–9 cm, 8- to 16-flowered; bracts triangular-lanceolate, 1–3 mm, subequal to pedicel; bracteoles triangular-lanceolate, 1–1.5 mm, inserted at calyx base. Calyx sericeous, conic-campanulate, 3–4 mm, with veins incrassate and decurrent only in the lip, lower lip longer than the upper, 1.8–2.2 × 1.5–1.8 mm, with teeth subequal, linear-subulate, slightly divaricate, lateral ones 0.7–0.8 mm, central one 0.8–1 mm, upper lip with teeth 1-nerved, ovate-triangular, apiculate, 1.4–1.8 mm. Floral buds with wings exserted from the standard; corolla yellow; standard ovate-cordate, rounded at apex, 7–7.5 × 6–7 mm, sericeous on back; wings 5.5–6.2 mm, with a tuft of hairs on the basal gibbosity; keel 9–9.5 mm, sericeous on the outer faces; anthers ovate-lanceolate, apiculate, 1–1.1 mm. Legume totally pubescent, ovate-beaked, ca. 8 mm.

Iconography. De Candolle (1826, tab. 36); Valsecchi (1986a, fig. 1); Brullo and De Marco (1996, fig. 3).

Chromosome number. $2n = 48$ (Santa Teresa di Gallura; Villa, 1980).

Distribution and ecology. *Genista ephedroides* occurs in Capo Testa and Santa Teresa di Gallura in northeastern Sardinia. It grows on granite substrates in thermophilous garigue vegetation at altitudes between 0 and 60 m. The bioclimate of the coastal area is Mediterranean pluviseasonal-oceanic, with thermotype upper thermomediterranean and ombrotype between upper dry and lower subhumid (Rivas-Martínez, 2007).

IUCN Red List category. *Genista ephedroides* has been previously evaluated as Least Concern (LC) according to IUCN Red List criteria (Scoppola & Spampinato, 2005).

Additional specimens examined. ITALY. Sardinia: Sarden, s.d., M. H. Vahl s.n. (G-DC); Sardaigne, J. H. Moris s.n. (G); "Sardaigne, ...à St. Teresa Gallura," 5 May/26 June 1881, L. Millet s.n. (G); Arrondissement de Tempio, Santa Teresa, E. Reverchon 93 (BM, C, G, WU); Gallura, Capo Testa westlich S. Teresa, H. Merxmüller & F.

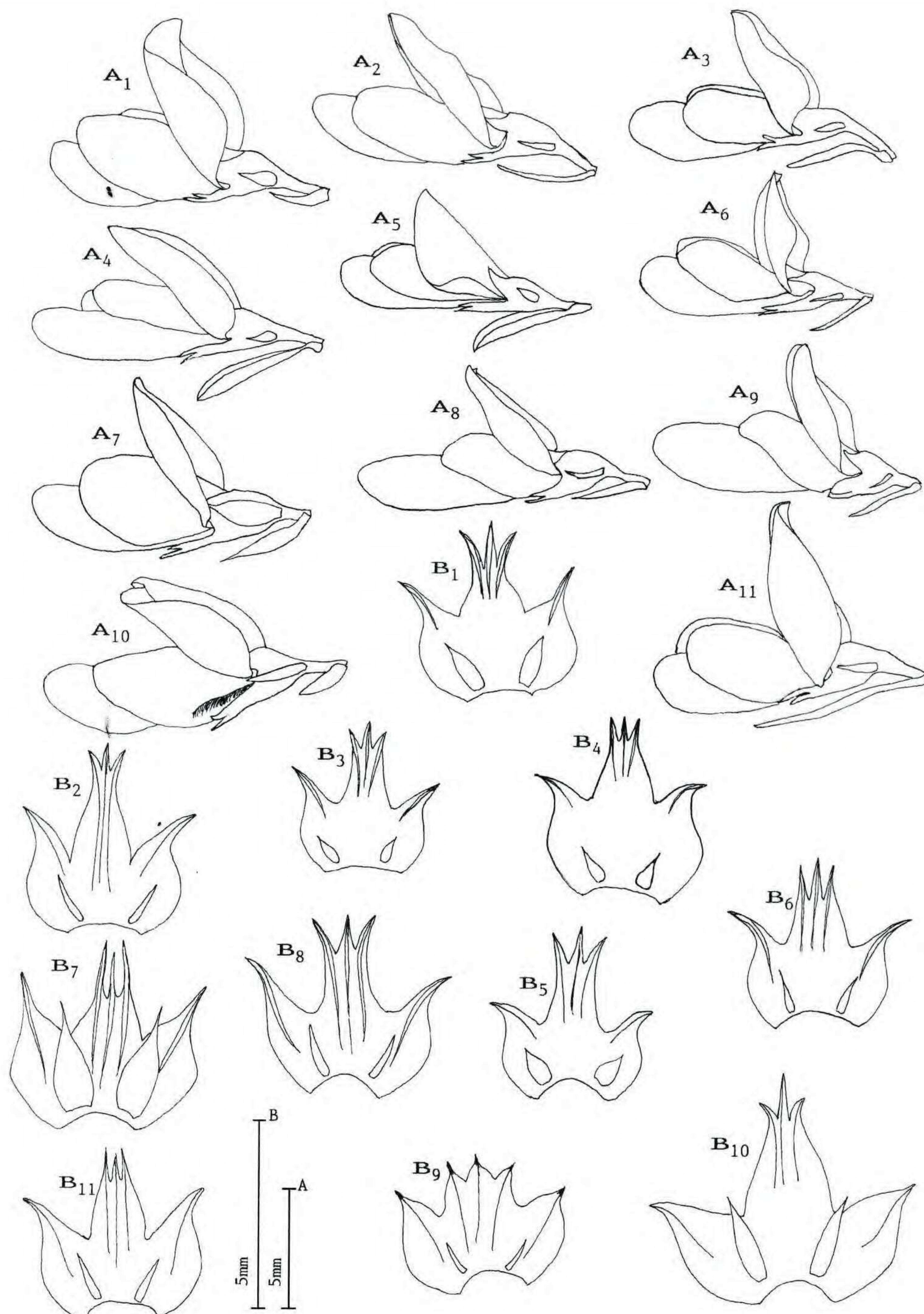


Figure 3. Flowers (A) and open calyces (B). —A₁, B₁. *Genista ephedroides* DC., based on 3 May 1995, Brullo & De Marco s.n. (CAT). —A₂, B₂. *G. valsecchiae* Brullo & De Marco, based on the type, 11 May 1994, Brullo et al. s.n. (CAT). —A₃, B₃. *G. insularis* Bacch., Brullo & Feoli Chiapella subsp. *insularis*, based on the type, 7 June 2002, Bacchetta et al. s.n. (CAT). —A₄, B₄. *G. insularis* subsp. *fodinae* Bacch., Brullo & Feoli Chiapella, based on the type, 6 June 2002, Bacchetta et al. s.n. (CAT). —A₅, B₅. *G. ovina* Bacch., Brullo & Feoli Chiapella, based on the type, 9 Mar. 2004, Bacchetta et al. s.n. (CAT). —A₆, B₆. *G. bocchierii* Bacch., Brullo & Feoli Chiapella, based on the type, 9 June 1998, Bacchetta & Brullo s.n. (CAT). —A₇, B₇. *G. tyrrhenia* Vals. subsp. *tyrrhenia*, based on 17 June 1992, Minissale s.n. (CAT). —A₈, B₈. *G. demarcoi* Brullo, Scelsi & Siracusa, based on the type, 3 June 1992, Brullo & Scelsi s.n. (CAT). —A₉, B₉. *G. gasparrinii* (Guss.) C. Presl, based on 24 May 1992, Scelsi & Siracusa s.n. (CAT). —A₁₀, B₁₀. *G. cilentina* Vals., based on 16 May 1993, Brullo et al. s.n. (CAT). —A₁₁, B₁₁. *G. tyrrhenia* subsp. *pontiana* Brullo & De Marco, based on the type, 16 May 1993, Brullo et al. s.n. (CAT).

Oberwinkler 20966 (M); Faro S. Teresa (Sassari), 29 May 1970, *F. Valsecchi s.n.* (TSB); Capo Testa (Sassari), 10 May 1971, *S. Pignatti s.n.* (TSB); S. Teresa di Gallura (Sassari), 5 June 1980, *L. Poldini s.n.* (TSB), 6 May 1986, *Schenev s.n.* (M), 16 May 1994, *S. Brullo, G. De Marco & P. Pavone s.n.* (CAT), 3 May 1995, *S. Brullo & G. De Marco s.n.* (CAT), 28 June 2003, *G. Bacchetta & M. Manconi s.n.* (CAG), 12 July 2003, *L. Feoli Chiapella s.n.* (TSB).

6. *Genista gasparrinii* (Guss.) C. Presl, Fl. Sicul. (Presl) 1: 19. 1826. Basionym: *Spartium gasparrinii* Guss., Ind. Sem. Hort. Boccad. 11. 1825, as “*S. gasparrini*.” TYPE: [Italy. Sicily:] asperis et rupibus calcareis, Sferracavallo, s.d., manu *Gussone* (lectotype, designated by Valsecchi [1993b: 810], NAP [Hb. Guss.], sub *Spartium gasparrini*). Figures 2A₂, B₂, 3A₉, B₉.

Erect shrub, often compact-pulvinate, intricate, 25–60 cm tall, with branches subrigid, slender, alternate or subclustered, obtuse at the apex, striate, sericeous. Leaves 3-foliate, uppermost often simple, sessile, linear-lanceolate, revolute, sericeous, 3–7 mm, caducous. Inflorescence ± dense, 1–5 cm, 3- to 11-flowered; bracts linear-subulate, leafy, 2.5–2.7 mm, much longer than pedicel; bracteoles subulate, 0.7–1 mm, inserted at calyx base. Calyx sericeous, campanulate, 2.8–3 mm, with veins thin and extended almost to base, lower lip subequal to upper, 1–1.2 × 1.5–2 mm, with teeth subequal, widely triangular, obtuse, apiculate, slightly divaricate, ca. 0.5 mm, upper lip with teeth 1-nerved, widely triangular, obtuse, apiculate, ca. 1 mm; floral buds with wings wholly covered by the standard; corolla yellow; standard ovate-triangular, retuse at apex, 5–7 × 5–7 mm, sericeous on back; wings 6–7 mm, with glabrous lateral lobe; keel 8–10 mm, sericeous on outer faces; anthers ovate, apiculate, ca. 1 mm. Legume sparsely pubescent, subcircular or broadly ovate, 7–8 mm.

Iconography. Brullo et al. (1993, figs. 2, 4A₁, 4B₁).

Chromosome number. $2n = 48$ (Colombo et al., 1979).

Distribution and ecology. *Genista gasparrinii* is exclusive to Mt. Gallo, near Sferracavallo in northern Sicily. It is a chasmophyte growing on Mesozoic limestone cliffs, near the sea in areas with northern exposures, at altitudes from 50 to 100 m. The bioclimate is Mediterranean pluviseasonal-oceanic, with thermotype upper thermomediterranean and ombrotype upper dry (Brullo et al., 1996).

IUCN Red List category. *Genista gasparrinii* has been previously evaluated as Critically Endangered

(CR) according to IUCN Red List criteria (Scoppola & Spampinato, 2005).

Additional specimens examined. ITALY. Sicily: Sicile, s.d., *G. Gussone s.n.* (G); Prope Panorme et in insulis relatis, s.d., *G. Gasparrini s.n.* (FI); Sferracavallo, s.d., *G. Gasparrini s.n.* (F); Mt. Gallo presso Palermo, s.d., *G. Gussone s.n.* (FI); Mt. Gallo, 1827, *G. Gasparrini s.n.* (FI), 10 July 1840, *T. Heldreich s.n.* (G), s.d., *A. Todaro s.n.* (WU), Oct. 1848, *A. Todaro* (PAL), May 1856, *A. Huet du Pavillon* (G), *M. Lojacono* 477 (BM, G), 1 Oct. 1977, *S. Brullo s.n.* (CAT), 24 May 1992, *F. Scelsi & G. Siracusa s.n.* (CAT); Palermo a Mt. Gallo, s.d., *G. Gussone s.n.* (FI), 16 May 1996, *E. Schimmenti & G. Scafidi s.n.* (TSB); Mt. Gallo, prope Panormum, 1828, *G. Gussone s.n.* (G); Panormi a Sferracavallo, 25 Apr. 1835, *F. Parlato s.n.* (FI); Mt. Gallo, Sferracavallo, s.d., *F. Parlato s.n.* (G), 4 July 1992, *F. Scelsi s.n.* (CAT); Palermo a Sferracavallo, 1844, *F. Parlato s.n.* (G), s.d., *A. Todaro s.n.* (WU), May, *A. Todaro* 227 (BM, M, OXF, PAL), *C. C. Lacaia* 323 (BM); Palermo, May, *M. Lojacono s.n.* (M); Capaci, June 1896, *Mandralisca s.n.* (PAL).

7. *Genista insularis* Bacch., Brullo & Feoli Chiapella, sp. nov. TYPE: [Italy. Sardinia:] Sardegna, Domus de Maria (CA), 7 June 2002, *G. Bacchetta, S. Brullo & G. Giusso s.n.* (holotype, CAT; isotypes, CAG, CAT, FI). Figures 1A₅, B₅, 3A₃, B₃.

Haec species a *Genista valsechiae* Brullo & De Marco ramis flexuosis acutis inermibus, bractea linearis vel oblongo-linearis 3.5–6.5 mm longa, bracteolis lanceolatis vel triangulari-lanceolatis, calycis labio inferiore 2–2.2 mm longo, vexillo ad apicem leviter retuso 5–7 mm lato, carina 8–10 mm longa atque antheris oblongo-lanceolatis 1–1.3 mm longis differt.

Erect shrub, robust, lax, 100–150 cm tall, with branches flexuous, alternate or subclustered, acute at the apex, striate, pubescent. Leaves 3-foliate, uppermost often simple, sessile, linear-lanceolate, revolute, sericeous, 3–7 mm, caducous. Inflorescence ± dense, 3–7 cm, 4- to 9-flowered; bracts linear, 3.5–4 mm, much longer than the pedicel; bracteoles triangular-lanceolate, 1.3–1.5 mm, inserted at calyx base. Calyx sericeous, conic, 3.5–4 mm, with veins incrassate and decurrent only in the lip, lower lip longer than the upper, 2–2.2 × 1.3–1.6 mm, with teeth unequal, triangular, slightly divaricate, lateral ones 0.4–0.5 mm, central one 0.6–0.7 mm, upper lip with teeth 1-nerved, ovate-triangular, apiculate, 1.5–1.8 mm; floral buds with wings covered by the standard; corolla yellow; standard ovate-cordate, retuse at the apex, 6.5–7 × 5–5.6 mm, sericeous on the back; wings 6.5–7 mm, with a tuft of hairs on the basal gibbosity; keel 8–8.5 mm, sericeous on outer faces; anthers oblong-lanceolate, apiculate, 1.2–1.3 mm. Legume totally pubescent, ovate-beaked, ca. 8 mm.

Chromosome number. $2n = 48 + (0-2B)$ (Domus de Maria, S'Isca Manna [Cagliari], 2 June 2000, *G. Bacchetta, G. Sotgiu Cocco & M. Casti s.n.* [CAG], new count).

Distribution and ecology. The new species is circumscribed to the southwestern part of the Sulcis massif in southern Sardinia (Punta Is Laghixeddas, Riu s'Accorradroxiu, S'Isca Manna–Domus de Maria). *Genista insularis* grows on granite and metamorphic substrates at altitudes from 80 to 360 m, where it is frequent in garigue vegetation occurring in oak wood clearings. The bioclimate is Mediterranean pluviseasonal-oceanic, with thermotype ranging between upper thermomediterranean and lower mesomediterranean, and ombrotype between upper dry and lower subhumid (Bacchetta, 2006).

IUCN Red List category. *Genista insularis* is assessed here as Least Concern (LC) according to IUCN Red List criteria (IUCN, 2001, 2003).

Etymology. The specific epithet is from the Latin “insula,” meaning “island.”

Paratypes. ITALY. Sardinia: Domus de Maria, 13 June 1971, N. Kaae s.n. (C); Domus de Maria, M.ti Sa Guardia, 18 Apr. 1998, *G. Bacchetta s.n.* (CAG, TSB), 9 June 1998, *G. Bacchetta & S. Brullo s.n.* (CAT); S'Isca Manna, Domus de Maria (CA), 9 June 1998, *G. Bacchetta & S. Brullo s.n.* (CAT); Domus de Maria, SS. 195, 4 km direzione Teulada (Cagliari), 1 July 1998, *G. Bacchetta s.n.* (CAG); Domus de Maria, S'Isca Manna (Cagliari), 2 June 2000, *G. Bacchetta, G. Sotgiu Cocco & M. Casti s.n.* (CAG); Riu s'Accorradroxiu-Domus de Maria (Cagliari), 25 Mar. 2004, *G. Bacchetta & C. Pontecorvo s.n.* (CAG, TSB).

7a. *Genista insularis* subsp. *insularis*.

7b. *Genista insularis* subsp. *fodinae* Bacch., Brullo & Feoli Chiapella, subsp. nov. TYPE: [Italy. Sardinia:] Sardegna, Monte Conca s'Omù, Fluminimaggiore (CA), 6 June 2002, *G. Bacchetta, S. Brullo, M. Casti & G. Giusso s.n.* (holotype, CAT; isotypes, CAG, CAT, FI). Figures 1A₃, B₃, 3A₄, B₄.

A *Genista insulari* Bacch., Brullo & Feoli Chiapella subsp. *insulari* bractea oblongo-lineari 5–6.5 mm longa, bracteolis lanceolatis, calyce 4–4.5 mm longo dentibus labii inferioris erectis 0.7–0.8 mm longis, vexillo 8–9 mm longo 6–7 mm lato, alis 7.5–8.5 mm longis, carina 9–10 mm longa atque antheris ca. 1 mm longis differt.

Erect shrub, robust, lax, 100–200 cm tall, with branches flexuous, alternate or subclustered, acute at the apex, striate, pubescent. Leaves 3-foliate, uppermost often simple, sessile, linear-lanceolate,

revolute, sericeous, 3–7 mm, caducous. Inflorescence ± dense, 2–4 cm, 4- to 8-flowered; bracts oblong-linear, 5–6.5 mm, slightly longer than the pedicel; bracteoles lanceolate, 1.2–1.5 mm, inserted at calyx base. Calyx sericeous, conic-campanulate, 4–4.5 mm, with veins incrassate and decurrent only in the lip, lower lip longer than the upper, 2–2.2 × 1.5–2 mm, with teeth subequal, triangular-subulate, erect, 0.7–0.8 mm, upper lip with teeth 1-nerved, ovate-triangular, apiculate, 1.2–1.5 mm; floral buds with wings covered by the standard; corolla yellow; standard ovate-cordate, retuse at the apex, 8–9 × 6–7 mm, sericeous on the back; wings 7.5–8.5 mm, with a tuft of hairs on the basal gibbosity; keel 9–10 mm, sericeous on the outer faces; anthers oblong-lanceolate, apiculate, ca. 1 mm. Legume totally pubescent, ovate-beaked, ca. 8 mm.

Chromosome number. $2n = 48$ (Su Zurfuru-Fluminimaggiore [Cagliari], 210 m, 10 July 2002, *G. Bacchetta & C. Pontecorvo s.n.* [CAG], new count).

Distribution and ecology. *Genista insularis* subsp. *fodinae* is endemic to the Iglesiente subsector in southwestern Sardinia, Italy, and in particular occurs in the mining areas of Monte Conca's Omù and Su Zurfuru, near Fluminimaggiore. The new subspecies grows on metalliferous metamorphic substrates at altitudes from 120 to 215 m, where it colonizes the rocky places and loose substrates within pioneer plant communities. The bioclimate is Mediterranean pluviseasonal-oceanic, with thermotype ranging between upper thermomediterranean and lower mesomediterranean, and ombrotype between lower and upper subhumid (Bacchetta, 2006).

IUCN Red List category. *Genista insularis* subsp. *fodinae* is assessed here as Near Threatened (NT) according to IUCN Red List criteria (IUCN, 2001, 2003).

Etymology. The subspecific epithet refers to the Latin “fodina,” meaning “mine,” because the new taxon grows in the mining areas of Iglesiente, in southwestern Sardinia.

Note. Two subspecies are recognized within *Genista insularis*. They are quite different from both the morphological and eco-chorological viewpoint. These taxa share the same habit with flexuous and loose branches that are acute and not mucronate-pungent at apex; inflorescences with up to eight to 10 flowers; and a calyx with incrassate veins, retuse standard, and wings that are covered by the standard in the bud. *Genista insularis* subsp. *fodinae* differs from the autonymic subspecies in having oblong-linear bracts 5–6.5 mm long (vs. linear bracts 3.5–4

mm long in subspecies *insularis*), lanceolate bracteoles (vs. triangular-lanceolate), the calyx 4–4.5 mm long with lower lip teeth 0.7–0.8 mm long (vs. 3.5–4 mm long with lower lip teeth 0.4–0.7 mm long), the standard 8–9 × 6–7 mm (vs. 6.5–7 × 5.5–6 mm), wings 7.5–8.5 mm long (vs. 6.5–7 mm long), the keel 9–10 mm long (vs. 8–8.5 long), and anthers ca. 1 mm long (vs. 1.2–1.3 mm long). In addition to these morphological differences, there are some relevant ecological and chorological differences. *Genista insularis* subsp. *insularis* occurs in a small area of southern Sardinia (near Cagliari), where it grows on granitic and compact metamorphic substrates, while the subspecies *fodinae*, which is also extremely circumscribed, has a northernmost localization (near Iglesias), where it is found on metalliferous loose substrates.

Paratypes. ITALY. Sardinia: Iglesias, 30 Apr. 1983, G. De Marco s.n. (CAT); Fluminimaggiore CA, 1 May 1995, S. Brullo & G. De Marco s.n. (CAT); Fluminimaggiore, Miniera de Su Zurfurru (Cagliari), 10 July 2002, G. Bacchetta, G. Garau, L. Piras & C. Pontecorvo s.n. (CAG); Su Zurfurru-Fluminimaggiore (Cagliari), 215 m, 25 Mar. 2004, G. Bacchetta & C. Pontecorvo s.n. (CAG, TSB).

8. *Genista numidica* Spach, Ann. Sci. Nat., Bot., ser. 3, 2: 244. 1844. Replaced synonym: *Spartium sphaerocarpum* Desf. ex Spach, Ann. Sci. Nat., Bot., ser. 3, 2: 244. 1844, pro syn., nom. inval. non *Spartium sphaerocarpum* L., Mant. Pl. Altera: 571. 1771. TYPE: [Algeria.] Numidia, s.d., R. L. Desfontaines s.n. (lectotype, designated here, FI-W, sub *Spartium sphaerocarpum*).

Erect shrub to arborescent, robust, 60–250 cm tall, with branches lax, flexuous, alternate or subclustered, acute at the apex, striate, glabrescent. Leaves 3-foliate, uppermost often simple, sessile, linear-lanceolate, revolute, sericeous, 5–13 mm, caducous. Inflorescence ± dense, 1.5–10 cm, 5- to 30-flowered; bracts linear to linear-lanceolate, 3.5–4 mm, much longer than pedicel; bracteoles linear, 2–2.5 mm, inserted at calyx base. Calyx sericeous, conic-campanulate, 3–5 mm, with veins thin and extended almost to base, lower lip longer than upper, 2.5–3 × 0.5–1 mm, with teeth unequal, triangular to sub-linear, slightly divaricate, lateral ones 0.5–0.6 mm, central one 0.8–1 mm, upper lip with teeth 1-nerved, triangular, acute, 2–2.5 mm; floral buds with wings wholly covered by standard; corolla yellow; standard ovate-cordate, retuse at apex, 8–9 × ca. 5 mm, sericeous on back; wings 6–8 mm, with a tuft of hairs on basal gibbosity; keel 9–11 mm, sericeous on outer faces; anthers oblong, aristate, 0.5–0.75 mm. Legume totally pubescent, ovoid-beaked, 5.5–6 mm.

Iconography. Maire (1987, fig. 54).

Chromosome number. Unknown.

Distribution and ecology. *Genista numidica* is circumscribed to Algeria, where it grows in garigue and maquis ecosystems at altitudes between 0 and 1100 m. The bioclimate is Mediterranean pluviseasonal-oceanic, with thermotype ranging between upper thermomediterranean and upper mesomediterranean, and ombrotype between upper dry and upper subhumid (Rivas-Martínez, 2007).

IUCN Red List category. *Genista numidica* is assessed here as Data Deficient (DD) according to IUCN Red List criteria (IUCN, 2001, 2003).

Note. In the protologue of *Genista numidica*, Spach (1844) indicated as synonym *Spartium sphaerocarpum* Desf. (in Herb. Flor. Atlant. quod flores solum[!], in sched.). This unpublished name, written by Desfontaines on the label of a specimen coming from his own *Flora Atlantica* collection, is a nomen nudum. This name is unavailable for use because it is a later homonym of *S. sphaerocarpum* L. Therefore, this name being illegitimate, Spach (1844) proposed a different epithet (*numidica*) for this species. However, Spach failed to designate a type for the species. For this reason, a type needs to be assigned for *G. numidica* from among the Desfontaines specimens that he identified as *S. sphaerocarpum*. There is a Desfontaines specimen at FI-W of *Flora Atlantica* labeled “*Spartium sphaerocarpum*, Numidia,” which is here designated as lectotype.

Additional specimens examined. ALGERIA. Saffsaf, Philippeville, 11 May 1853, R. Gallerand s.n. (B); entre Stora et Philippeville, 3 June 1858, S. Choulette s.n. (B, P); Kabylie, Tifrit, 30 May 1866, A. Letourneux s.n. (P); Caroubiers, Bône, 22 Apr. 1866, Tribout s.n. (B), May 1875, A. Meyer s.n. (P), May 1841, M. C. Durieu de Maisonneuve s.n. (LG); Coteaux du Fort Génois, Bône, 21 May 1892, D. Luizet s.n. (B); Bône, entre la Ville et le Cap de Garde, 10 May 1906, H. Romieux s.n. (B); Djidjelli, 23 Apr. 1938, G. Andreánszky s.n. (B); Dept. d'Alger, Tamgout d'Azazga, 6 June 1952, L. Faurel s.n. (LG); Dépt. d'Orléansville, entre Ain N'Sour et Tizi Franco, 17 May 1964, A. Dubuis et L. Faurel s.n. (LG); Annaba, Wilaya Annaba, 7 July 1979, A. Dubuis [Soc. l'éch. Pl. vasc. l'Europe Bass. Méd.] 17084 (LG); Wilaya de Jijel, entre Jijel & Ziama-Mansouria, 9 June 1984, A. Dubuis s.n. (LG); Parc Natl. l'Akfadan, Yakourren, 27 May 1984, A. Bologna s.n. (CAT); Wilaya Jijel, 16 June 1984, D. Podlech s.n. (LG); Parc Natl. d'Akfadou, Wilaya Tizi-Ouzou, 40 km à l'E de Tizi-Ouzou, 25 May 1989, A. Dubuis [Soc. l'éch. Pl. vasc. l'Europe Bass. Méd.] 17085 (LG).

9. *Genista ovina* Bacch., Brullo & Feoli Chiapella, sp. nov. TYPE: [Italy. Sardinia:] Capo Pecora, Portixeddu–Fluminimaggiore, metamorfiti pale-

ozoiche, 80 m, 9 Mar. 2004, *G. Bacchetta, M. Casti, A. De Murtas, C. Pontecorvo & J. Cano s.n.* (holotype, CAT; isotypes, CAG, CAT, FI). Figures 1A₆, B₆, 3A₅, B₅.

Haec species a *Genista valsecchiaiae* Brullo & De Marco habitu pulvinato, planta usque ad 60 cm tantum alta, bractea 3.5–4.5 mm longa, bracteolis ovato-triangularibus, calycis labio inferiori 3–3.5 mm longo dentibus 0.9–1.2 mm longis, vexillo ad apicem rotundato 7–7.5 mm longo 5–6 mm lato, alis 7–8 mm longis, carina 7.5–9 mm longa, alis in alabastro e vexillo exsertis atque antheris ellipticis rotundatis 1.1–1.2 mm longis differt.

Pulvinate, robust, intricate, 30–60 cm tall, with branches rigid, alternate or subclustered, acute at the apex, striate, pubescent. Leaves 3-foliate, uppermost often simple, sessile, linear-lanceolate, revolute, sericeous, 3–7 mm, caducous. Inflorescence ± dense, 1–4.5 cm, 5- to 12-flowered; bracts oblong-linear, 3.5–4.5 mm, much longer than the pedicel; bracteoles ovate-triangular, 0.8–1.5 mm, inserted at calyx base. Calyx sericeous, conic-campanulate, 3.5–5 mm, with veins thin and decurrent only on the lip, lower lip longer than the upper, 3–3.5 × 1.5–1.7 mm, with teeth subequal, linear-subulate, divaricate, 0.9–1.2 mm, upper lip with teeth 1-nerved, ovate-triangular, acute, 1.7–2.2 mm; floral buds with wings exserted from the standard; corolla yellow; standard ovate-cordate, rounded at the apex, 7–7.5 × 5–6 mm, sericeous externally; wings 7–8 mm, with a tuft of hairs on basal gibbosity; keel 7.5–9 mm, sericeous on outer faces; anthers elliptical, rounded at apex, 1.1–1.2 mm. Legume totally pubescent, ovate-beaked, ca. 8 mm.

Chromosome number. $2n = 44, 48$ (Capo Pecora, Portixeddu, Fluminimaggiore [CA], 9 June 2004, *G. Bacchetta, U. Gamper & C. Pontecorvo s.n.* [TSB], new count).

Distribution and ecology. *Genista ovina* is a very localized species, known only from Capo Pecora and Portixeddu, near Fluminimaggiore in southwestern Sardinia, where it grows on metamorphic substrates at altitudes between 40 and 100 m. The new species is dominant in thermophilous garigue vegetation occurring along the rocky coast. The bioclimate is Mediterranean pluviseasonal-oceanic, with thermo-type upper thermomediterranean and ombrotype upper dry (Bacchetta, 2006).

IUCN Red List category. *Genista ovina* is assessed here as Near Threatened (NT) according to IUCN Red List criteria (IUCN, 2001, 2003).

Etymology. The specific epithet is from the Latin “ovinus,” meaning “sheep.” In Italian, the word “pecora” also refers to sheep, and the plants grow on

Capo Pecora, in Arbus municipality, southwestern Sardinia.

Paratypes. ITALY. Sardinia: Portixeddu (Cagliari), 23 June 1973, *E. & S. Pignatti, A. Avanzini & P. Nimis s.n.* (TSB); Portixeddu, Rupi marittime (Cagliari), 23 June 1973, *E. & S. Pignatti, A. Avanzini & P. Nimis s.n.* (TSB); Capo Pecora, rupi litorali e nell'interno, 6 Apr. 1977, *Milia & L. Mossa s.n.* (CAG); Strasse zum Capo Pecora, ca. 2 km NW von Portixeddu, 2 May 1986, *J. Poelt s.n.* (M); Capo Pecora, Portixeddu, Fluminimaggiore (CAG), 11 June 1998, *G. Bacchetta & S. Brullo s.n.* (CAT), 9 Feb. 2004, *G. Bacchetta, J. Cano, M. Casti, A. De Murtas, C. Pontecorvo s.n.* (TSB); Fluminimaggiore, Portixeddu, Capo Pecora (Cagliari), 80 m, 9 June 2004, *G. Bacchetta, U. Gamper & C. Pontecorvo s.n.* (CAG, TSB).

10. *Genista tyrrhenia* Vals., Boll. Soc. Sarda Sci. Nat. 25: 145. 1986, as “*thyrrrena*” [corr. ICBN, Art. 60.1]. TYPE: [Italy. Sicily:] “in sylvaticis Vulcano (Eolie),” Apr. 1902, *G. Zodda s.n.* (holotype, FI). Figures 2A₁, B₁, 3A₇, B₇.

Erect shrub to arborescent, robust, 100–400 cm tall, with branches flexuous, alternate or subclustered, truncate or obtuse at the apex, striate, sericeous or sericeous-pubescent. Leaves 3-foliate, uppermost often simple, sessile, linear-lanceolate, revolute, sericeous, 7–12 mm, caducous. Inflorescence ± dense, 3–15 cm, 10- to 30-flowered; bracts linear-subulate to ovate-lanceolate, 1.5–5 mm, much longer than the pedicel; bracteoles lanceolate, 2–4.5 mm, inserted at the calyx base. Calyx sericeous, conic-campanulate, 4–7 mm, with veins incrassate and extended almost up to the base, lower lip longer than the upper, 2.5–4 × ca. 2 mm, with teeth unequal, subulate, not divaricate, lateral ones 1–2 mm, central one 0.8–1.2 mm, upper lip with teeth 1-nerved, ovate-triangular, long acuminate, 2.1–3.5 mm; floral buds with wings wholly covered by the standard; corolla yellow; standard ovate-subcircular, rounded at the apex, 8–12 × ca. 8 mm, sericeous on the back; wings 8–10 mm, with a tuft of hairs on the basal gibbosity; keel 9–11 mm, sericeous on the outer faces; anthers oblong-lanceolate, apiculate, 1.2–1.4 mm. Legume totally pubescent, ovate-beaked, 8–10 mm.

Iconography. Valsecchi (1986b, fig. 2); Brullo et al. (1993, figs. 3, 4A3, 4B3).

Chromosome number. $2n = 48$ (Lipari, Capistrello, Isole Eolie [Messina], 6 July 2002, *S. Pasta s.n.* [TSB], new count).

Distribution and ecology. The autonymic subspecies is present on Vulcano, Lipari, Salina, Panarea, and Stromboli (Aeolian Islands, Italy). It grows on

volcanic substrates, in thermophilous garigue vegetation at altitudes of 0–800 m. The bioclimate is Mediterranean pluviseasonal-oceanic, with thermotype ranging between upper thermomediterranean and lower mesomediterranean, and ombrotype between upper dry and lower subhumid (Brullo et al., 1996).

IUCN Red List category. *Genista tyrrhena* is assessed here as Least Concern (LC) according to IUCN Red List criteria (IUCN, 2001, 2003).

Additional specimens examined. ITALY. Sicily: In insulis Aeoliis, s.d., s. coll. (BM); Vulcano al piano Casa Sperazzi, 8 May 1844, s. coll. (PAL); Lipari, Oct. 1858, *Mandalisca* s.n. (FI), 29 May 1933, J. F. N. Bormüller 514 (C); Isole Eolie in tutte le isole, May 1877, M. Lojacono s.n. (WU); Lipari, June 1881, A. Borzì s.n. (WU); Vulcano (Eolie), Apr. 1902, G. Zodda s.n. (FI), July 1902, L. Nicotra s.n. (FI), June 1881, A. Borzì s.n. (FI), 22 Apr. 1962, C. M. Christensen s.n. (C); Stromboli, 8 Apr. 1913, F. K. M. Vieerhapper s.n. (WU); Vulcano Italian, 22 Apr. 1962, K. Larsen s.n. (C); Lipari Acqua Calda, 20 May 1969, S. Brullo s.n. (CAT); Vulcano, Isole Eolie (Messina), 22 May 1969, D. Lausi s.n. (TSB), June 1969, S. Pignatti s.n. (TSB); Stromboli, Isole Eolie (Messina), 25 May 1969, D. Lausi s.n. (TSB); Lipari, Marina Piccola, Isole Eolie (Messina), 1 June 1969, S. Pignatti s.n. (TSB); Salina, 14 May 1970, S. Brullo s.n. (CAT); Cava di Pomice, Lipari, 13 May 1972, S. Brullo s.n. (CAT); Porticello, Lipari, 25 Apr. 1982, S. Brullo s.n. (CAT); Tra Canneto e Porticello, Lipari, 17 June 1992, *Minissale* s.n. (CAT); Panarea, 28 Apr. 1982, S. Brullo s.n. (CAT); Stromboli sopra Fico Grande, 8 May 1990, S. Brullo, P. Minissale, F. Scelsi & G. Spampinato s.n. (CAT); Lipari, Capistrello, Isole Eolie (Messina), 6 July 2002, S. Pasta s.n. (TSB).

10a. *Genista tyrrhena* subsp. *tyrrhena*.

10b. *Genista tyrrhena* subsp. *pontiana* Brullo & De Marco, subsp. nov. TYPE: [Italy.] Lazio: Isola di Ponza, 16 May 1993, S. Brullo, F. Scelsi & G. Siracusa s.n. (holotype, CAT; isotypes, CAG, CAT, FI). Figures 2A₄, B₄, 3A₁₁, B₁₁.

A *Genista tyrrhena* Vals. subsp. *tyrrhena* bractea linearitriangulari vel linearisubulata 3–13 mm longa, bracteolis lanceolato-subulatis vel subulatis 1.8–2 mm longis, calyce 3.5–5.5 mm longo labio inferiore 2–2.7 mm longo 1.4–1.8 mm lato dentibus 0.7–1 mm longis atque alis in alabastro e vexillo exsertis differt.

Erect shrub to arborescent, robust, 100–250 cm tall, with branches flexuous, lax, alternate or subclustered, truncate or obtuse at the apex, striate, sericeous. Leaves 3-foliate, uppermost often simple, sessile, linear-lanceolate, revolute, sericeous, 7–12 mm, caducous. Inflorescence ± dense, 5–12 cm, 10- to 30-flowered; bracts linear-triangular to linear-subulate, 3–13 mm, much longer than pedicel; bracteoles lanceolate-subulate to subulate, 1.8–2

mm, inserted at calyx base. Calyx sericeous, conic-campanulate, 3.5–5.5 mm, with veins thin and slightly extended toward base, lower lip longer than upper, 2–2.7 × 1.4–1.8 mm, with teeth unequal, linear-subulate, not divaricate, lateral ones 0.9–1 mm, central one 0.7–0.8 mm, upper lip with teeth 1-nerved, ovate-triangular, apiculate, 2–2.7 mm; floral buds with wings exserted from the standard; corolla yellow; standard ovate-subcircular, rounded at the apex, 9–11 × 7–8 mm, sericeous on back; wings 8–9 mm, with a tuft of hairs on basal gibbosity; keel 8–10 mm, sericeous on outer faces; anthers oblong-lanceolate, apiculate, 1.2–1.4 mm. Legume totally pubescent, ovate-beaked, 10–11 mm.

Chromosome number. $2n = 48 + (0\text{--}2B, 72, 96)$ (Zannone, M. Pellegrino, Isole Ponziane [Latina], 6 May 2000, P. Mayer s.n. [TSB], new count).

Distribution and ecology. *Genista tyrrhena* subsp. *pontiana* is circumscribed to the Pontine Islands off the coast of west-central Italy and grows on volcanic substrates, in thermophilous garigue vegetation at altitudes of 0–280 m. The bioclimate is Mediterranean pluviseasonal-oceanic, with thermotype ranging between upper thermomediterranean and lower mesomediterranean, and ombrotype between upper dry and lower subhumid (Rivas-Martínez, 2007).

IUCN Red List category. *Genista tyrrhena* subsp. *pontiana* is assessed here as Least Concern (LC) according to IUCN Red List criteria (IUCN, 2001, 2003).

Etymology. The specific epithet refers to the Pontine Archipelago.

Paratypes. ITALY. Latium: Ponza, sulle rupi marittime presso il semaforo, 27 Apr. 1900, A. Beguinot (FI); Zannone, M. Pellegrino nel bosco, May 1950–June 1951, B. Anzalone s.n. (RO); Palmarola, 11 Apr. 1966, B. Anzalone s.n. (RO); Isola di Ponza, 16 May 1993, S. Brullo, F. Scelsi & G. Siracusa s.n. (CAT); Isola di Ponza [Arcipelago Ponziano], Mt. Guardia, 9 Apr. 1969, B. Anzalone s.n. (RO), 10 May 1982, G. De Marco s.n. (CAT); Piana d'Incenso, 9 Apr. 1969, B. Anzalone s.n. (RO); Li Conti, 9 Apr. 1969, B. Anzalone s.n. (RO); Isola di Gavi, 18 Apr. 1971, L. Veri s.n. (RO); Isola di Ponza, tra Ponza e il M. Pagliaro, 20 May 1987, M. G. Mariotti s.n. (FI); Zannone, M. Pellegrino, Isole Ponziane (Latina), 6 May 2000, P. Mayer s.n. (TSB).

11. *Genista valsecchiai* Brullo & De Marco, Pl. Syst. Evol. 200: 275. 1996. TYPE: [Italy.] Sardinia: Isola di San Pietro, contr. Giacchino, 11 May 1994, S. Brullo, G. De Marco & P. Pavone s.n. (holotype, CAT). Figures 1A₂, B₂, 3A₂, B₂.

Erect shrub, robust, intricate, 30–150 cm tall, with branches rigid, alternate or subclustered, mucronate, pungent at the apex, striate, pubescent. Leaves 3-foliate, uppermost often simple, sessile, linear-lanceolate, revolute, sericeous, 3–10 mm, caducous. Inflorescence ± dense, 2.5–6 cm, 5- to 11-flowered; bracts linear-lanceolate, 1–3.5 mm, longer than the pedicel; bracteoles linear-lanceolate, 0.5–1.5 mm, inserted at the calyx base. Calyx sericeous, conic-campanulate, 3.5–5 mm, with veins thin and extended almost up to the base, lower lip longer than the upper, 2.5–3 × ca. 1.5 mm, with teeth equal, lanceolate-subulate, slightly divaricate, 0.5–0.8 mm, upper lip with teeth 2-nerved, ovate-triangular, long apiculate, 1.5–2.2 mm; floral buds with wings covered by the standard; corolla yellow; standard cordate, obtuse at the apex, 6–6.5 × ca. 7 mm, sericeous on the back; wings 6–7 mm, with a tuft of hairs on the basal gibbosity; keel 9–10 mm, sericeous on the outer faces; anthers ovate-lanceolate, apiculate, 0.9–1 mm. Legume totally pubescent, ovate-beaked, ca. 8 mm.

Iconography. Brullo and De Marco (1996, fig. 1).

Chromosome number. $2n = 48$ (Sant'Antioco [Cagliari], 27 Apr. 1984, *L. Rizzi Longo* s.n. [TSB], new count).

Distribution and ecology. *Genista valsecchiae* is widespread in southwestern Sardinia between Capo Frasca and Pula, including the islands of San Pietro and Sant'Antioco. It grows on granite, metamorphic, and volcanic substrates at altitudes of 0–100 m, where it is a structural species of thermophilous garigue ecosystems, near the coast. The bioclimate is Mediterranean pluviseasonal-oceanic or xeric-oceanic, with thermotype upper thermomediterranean and ombrotype upper dry.

IUCN Red List category. *Genista valsecchiae* is assessed here as Near Threatened (NT) according to IUCN Red List criteria (IUCN, 2001, 2003).

Additional specimens examined. ITALY. Sardinia: Figola by Antioco, s.d., s. coll. (OXF); St. Antioco, May, *F. Müller* s.n. (M); Antioco, Sardinia, 1828, *F. Müller* s.n. (OXF); Pula, May 1829, *J. H. Moris* s.n. (TO); Capo Spartivento nei colli fra il Golfo Malfitano e Domus de Maria, 21 Apr. 1893, *U. Martelli* s.n. (FI); Cagliari, Porto S. Efisio, Pula, 14 Apr. 1894, *U. Martelli* s.n. (FI); Isola di S. Antioco, M. Perdas de Fogu, 26 Apr. 1894, *U. Martelli* s.n. (FI); Portovesme, 6 Apr. 1896, *U. Martelli* s.n. (FI); Isola di S. Antioco, macchie under Strasse 3 km südöstlich Calasetta, 9–20 Apr. 1966, *H. Merxmüller & F. Oberwinkler* 21037 (M); Carloforte, Isola di S. Pietro, 30 July 1970, *L. Mossa & G. Mura* s.n. (CAG); Sard. Antioco Island, 4 km S of Antioco town, 12 Apr. 1973, *C. J. Humphries & I. Richardson* 227 (C); Isola di S. Antioco, 3 Mar. 1975, *Milia*

& *L. Mossa* s.n. (CAG); Isola di S. Antioco, 20 Apr. 1975, *I. Camarda* s.n. (CAG); Pula, Agumu, 25 Mar. 1982, *E. Bocchieri & G. Zedda* s.n. (CAG); S. Pietro, 23 Apr. 1983, *G. De Marco* s.n. (CAT); Domus de Maria, Isola su Cardulinu, 11 Nov. 1983, *E. Bocchieri* 3675050 (CAG); S. Antioco (Cagliari), 27 Apr. 1984, *L. Rizzi Longo* s.n. (TSB); Carloforte, Isola di S. Pietro, la Caletta, 1 May 1984, *L. Mossa* s.n. (CAG); Portoscuso, 11 May 1994, *S. Brullo, G. De Marco & P. Pavone* s.n. (CAT); Spalmatore, Isola di San Pietro, 12 May 1994, *S. Brullo, G. De Marco & P. Pavone* (CAT); Pula, Agumu, 13 Apr. 1997, *G. Bacchetta* s.n. (CAG); Chia-Domus de Maria (Cagliari), 21 Apr. 1997, *C. Giusto* s.n. (TSB).

Acknowledgments. Thanks to the curators and directors of BC, BM, C, CAG, CAT, FI, G, LG, M, NAP, OXF, P, PAL, RO, TO, TSB, W, and WU for the use of specimens; to the Director of the Botanical Garden of Palermo; and to S. Pasta (Palermo) and P. Mayer (Stazione Forestale di Sabaudia, Latina) for having supplied us with seeds.

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